

REMARKS/ARGUMENTS

In response to the Office Action dated January 18, 2007, claims 16-20, 23-29 and 31-34 have been canceled, and claims 35-51 have been added. Claims 35-31 are now active in this application. No new matter has been added.

OBJECTION TO CLAIMS

Claims 16-19, 23-29 and 31-34 have been objected to. The Examiner has identified phrases in claims 16, 18 and 19 that lack clear antecedent basis.

The rejection is moot as to canceled claims 16-19, 23-29 and 31-34.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

Claim 23 has been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner contends that “in the upper side of the vertical direction of the optical member” is unclear.

The rejection is moot as to canceled claim 23.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 102 AND § 103

I. Claims 16-18, 24, 27-29, 31, 32 and 34 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tomio (JP 11-337942) [actually Kawato et al., as Kawato is the last name of the first inventor and Tomio is his first name), in view of Wang et al. (US 2001/0055075).

Claim 25 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kawato et al. in view of Wang et al., as applied to claim 18, and further in view of Bourdelais et al. (USPN 6,846,098).

Claim 26 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kawato et al. in view of Wang et al., as applied to claim 18, and further in view of Okuno (US Publication 2001/0006461).

Claim 33 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kawato et al. in view of Wang et al.,

II. The rejections are moot as to canceled claims 16, 17, 29 and 31-34.

NEW CLAIMS

Claims 35-51 are added and correspond to canceled claims 16-20, 23-29 and 31-34.

Tomino discloses that a hole part 5 is provided in a diffusion sheet 2 at at least one location thereof outside a light emitting plane, through which hole part 5 an engagement piece is inserted with play.

However, the object of the invention of Kawato et al. does not go beyond "prevent[ing] the development of luminance unevenness or the like caused by a discontinuous contact between the light diffusion sheet and the light guide plate due to the development of warping or wrinkles in the light diffusion sheet even when the lighting apparatus is used in a high-temperature environment" (see paragraph [0006] of Kawato et al.). On the other hand, an object of the present invention goes so far as to prevent the warping or curving due to the weight of the optical

member even when the lighting apparatus is rotated upside down, for example, as long as the light emitting plane of the optical member is parallel with the vertical direction (see page 1, line 22 to page 2, line 9 of the present specification).

It is for this reason that Kawato et al. requires only that there be provided at least one hole part in the optical sheet outside the light emitting plane, into which hole part a projection is inserted with play (see claim 1 and paragraph [0007] of Kawato et al.). Thus, the arrangement disclosed in Kawato et al. does not require four or more openings, as does the present invention.

The Examiner might be suggesting that providing at least one hole part literally discloses providing four or more opening portions, as in the present invention. However, since the object of the invention of Kawato et al. goes no further than as mentioned above, Kawato et al. does not disclose or even suggest the features specifically designating the positions at which the openings and locking portions are provided.

New independent claim 35 recites:

A lighting apparatus, comprising:
an optical member; and
a plurality of locking portions, wherein,
in cases where a light emitting plane of the optical member is parallel to a vertical direction, at least one opening is provided in each of four regions of the optical member that are demarcated by a line parallel to the vertical direction that passes through the center of gravity of the light emitting plane of the optical member and a line parallel to a horizontal direction that passes through the center of gravity,
in each of the four regions, the locking portion penetrates the at least one opening,
regardless of which two adjacent regions of the four regions are positioned vertically above with respect to the center of gravity when the lighting apparatus is set, the optical member is suspended by the locking portion penetrating the at least one opening in a vertically upper and horizontally left region with respect to the center of gravity, and by the locking portion penetrating the at least one opening in a vertically upper and horizontally right region with respect to the

center of gravity, as an upper peripheral portion of each locking portion abuts on an upper-edge portion of the corresponding opening, and

in a vertically lower side with respect to the center of gravity of the optical member, each of the locking portions penetrates the corresponding opening such that the optical member is not subjected to the stress caused by its own weight in the vertically upward direction, nor is it subjected to the stress caused by its contact in the vertically downward direction with the locking portion.

The features recited in independent claim 35 provide the effects of not just preventing the development of warping or wrinkles in the optical sheet, but also preventing the warping or curving of the optical member due to its own weight. This results both when the optical member is "suspended" at its vertically upper portion with respect to the center of gravity of the light emitting plane of the optical member, with the light emitting plane of the optical member being parallel with the vertical direction, and when the lighting apparatus is rotated upside down, for example, while the light emitting plane of the optical member remains parallel with the vertical direction.

The features of independent claim 38 also provide the aforementioned significant effect even when the lighting apparatus is rotated upside down, for example, while the light emitting plane of the optical member remains parallel with the vertical direction.

In Kawato et al., on the other hand, there is no assumption about such situations as where the lighting apparatus is rotated upside down while the light emitting plane of the optical member remains parallel with the vertical direction. As a result, Kawato et al. merely teaches the feature of providing at least one hole part outside the light emitting plane; even in Fig. 3, only a total of two hole parts are shown, each of which is provided in the left or right side of the optical member near its center in the vertical direction. Thus, Kawato et al. does not disclose or suggest providing four or more openings and locking portions nor their positions.

Take the example that the optical member shown in Fig. 3 of Kawato et al. were to be used with its light emitting plane being parallel with the vertical direction. Since there would not necessarily be a hole part located in the vertically upper side of the optical member with respect to the center of gravity of its light emitting plane into which an engagement piece is inserted, the upper portion of the optical member would start to hang down due to its own weight as the size of the apparatus increases.

Thus, the structure shown in Fig. 3 of Kawato et al. does not allow the optical member to be "suspended" at all times at its vertically upper side with respect to the center of gravity of the optical member, both when the optical member is simply "suspended" with the light emitting plane of the optical member being parallel with the vertical direction, and when the optical member is rotated upside down, for example, in a combination with the lighting apparatus disclosed in Wang et al., with the light emitting plane of the optical member being parallel with the vertical direction. Thus, the arrangement disclosed in Kawato et al. cannot prevent the warping or curving of the optical member due to its own weight when the lighting apparatus is rotated upside down, for example, in cases where the light emitting plane of the optical member is parallel with the vertical direction.

Therefore, independent claims 35 and 38 are patentable over Kawato et al. and Wang et al., considered alone or in combination.

New claim 48 recites:

A lighting apparatus comprising:
an optical member having a plurality of cutout portions; and
a plurality of locking portions associated with the cutout portions,
wherein, in cases where a light emitting plane of the optical member is
parallel with a vertical direction, the cutout portions are formed in the each end-
sides of the optical member at the top, bottom, left, and right of the optical

member with respect to the center of gravity of the light emitting plane, such that the cutout portions can be engaged with the locking portions,

wherein, regardless of which of the top, bottom, left, and right end-sides comes at the top when the lighting apparatus is set, the optical member is supported by an upper internal edge of each of the cutout portions in the left and right end-sides of the optical member abutting on the locking portion adapted to be engaged with the cutout portion.

These features are not disclosed in either Kawato et al. or Wang et al.

More particularly, the recited features of claim 48 allow the optical member to be suspended regardless of the manner of use of the lighting apparatus, i.e., regardless of which of the end-sides of the optical member in which cutout portions are formed comes at the top. Specifically, no matter which of the sides comes at the top, the upper internal edge of each cutout portion on the left and right end-side of the optical member abuts on the corresponding locking portion adapted to engage with the cutout portion.

By providing the cutout portions instead of the openings in the optical sheet, the need to penetrate the locking portions into the openings during the manufacture of the lighting apparatus can be eliminated. More specifically, it is only necessary to simply engage the cutout portions with the locking portions to manufacture the lighting apparatus, so that the lighting apparatus can be manufactured quickly and with smaller percentage defectives.

Thus, present independent claim 48 is patentable over Kawato et al. and Wang et al. also.

Claims 36-37, which depend from independent claim 35, claims 39-47, which depend from independent claim 38, and claims 49-51, which depend from independent claims 48, are patentable over Kawato et al. and Wang et al. for the same reasons as mentioned above.

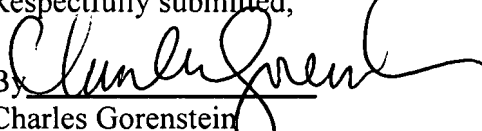
CONCLUSION

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Edward J. Wise (Reg. No. 34,523) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated:

Respectfully submitted,

By 

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